

**BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, DC 20554**

In the Matter of

QUALCOMM Incorporated

Petition for Declaratory Ruling

WT Docket No. 05-7

REPLY COMMENTS

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Summary

In these Reply Comments, QUALCOMM notes the support for its Petition from others in the 700 MHz community and refutes the criticisms made by opposing broadcasters. QUALCOMM shows that legal arguments against the use of OET-69 engineering studies to satisfy the requirements of Section 27.60 are unavailing. The Commission has the authority under the Administrative Procedure Act to interpret the rule to allow such use. Further, QUALCOMM refutes the claims that OET-69 is unsuitable as a way to measure interference from wireless services, such as MediaFLO. Similarly, QUALCOMM shows that OET-69 is not unsuitable for measuring interference to TV stations by addressing OET-69's alleged flaws and pointing out that, despite these, it is widely used today to predict interference.

QUALCOMM also argues that a *de minimis* standard of interference is appropriate, disputing the contention that the proper standard is "no new interference." The plain language of Section 27.60 shows that some level of interference was contemplated. Further QUALCOMM shows that use of the *de minimis* standard is in the public interest. QUALCOMM demonstrates that its proposals are virtually identical to the proposals put forward by Commission staff in the recent Report on Wireless Broadband Access, recommending flexible policies that will promote use of the 700 MHz spectrum.

QUALCOMM also argues that streamlined processing is in the public interest and is permissible under the APA. Finally, QUALCOMM points out that 700 MHz licensees will not receive a "windfall" if the QUALCOMM proposal is granted. Moreover, over the air television can best be protected through promotion of DTV, not at the expense of innovative new services like QUALCOMM's MediaFLO.

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REPLY COMMENTS

QUALCOMM Incorporated ("QUALCOMM") hereby submits these Reply Comments in response to the Comments in connection with its above-captioned Petition for Declaratory Ruling ("Petition"), filed on January 10, 2005. That Petition asked that the Federal Communications Commission ("FCC" or "Commission"): (1) declare that the process contained in Office of Engineering and Technology Bulletin No. 69 ("OET-69") is an acceptable engineering methodology to demonstrate compliance with the TV/DTV interference protection criteria of Section 27.60 of the Commission's Rules; (2) declare that a *de minimis* threshold of 2% will be established as the acceptable standard for interference; and (3) declare that streamlined processing procedures will be applied.

I. INTRODUCTION

A total of ten parties filed comments in response to the Commission's Public Notice of the Petition.¹ The majority of these supported QUALCOMM's efforts to clarify what is required by Section 27.60, and to develop procedures that will hasten the deployment of QUALCOMM's nationwide "mediacast" network, MediaFLO™, as well as other 700 MHz services. Particularly noteworthy were the comments of the 700 MHz Advancement Coalition, which pointed out the very recent Report of the Commission's Wireless Broadband Access Task Force which made recommendations to the Commission that are closely aligned with the requests made in the Petition.²

Several 700 MHz licensees voiced their support for the Petition, requesting a flexible review process,³ reduced uncertainty⁴ and a streamlined process for waiver requests.⁵ Technology vendor Flarion urged the Commission to consider carefully the use of OET-69, but stated its general support for proposals that encourage new and additional uses of the 700 MHz band.⁶

Only three Commenters were critical of the QUALCOMM Petition: The National Association of Broadcasters/Association for Maximum Service Television, Inc.

¹ *Pleading Cycle Established for QUALCOMM Incorporated Petition for Declaratory Ruling*, WT Docket No. 05-7, DA 05-87, January 18, 2005.

² 700 MHz Advancement Coalition Comments at 4, citing "Connected & On the Go: Broadband Goes Wireless, Report by the Wireless Broadband Access Task Force, on Docket No. 04-163, rel. March 8, 2005 at 62 (*Task Force Report*).

³ Access Spectrum Comments at 4.

⁴ Harbor Wireless Comments at 2; Motorola Comments at 3. Motorola holds one license for 700 MHz guardband, but it is also a vendor to public safety and commercial interests. Motorola Comments at 2.

⁵ Core Wireless Comments at 4; Aloha Partners Comments at 4.

⁶ Flarion Comments at 2. Flarion's comments also discuss an issue that is unrelated to the QUALCOMM Request concerning use of OET-69 in Part 27.60 engineering studies. Flarion discusses interference to other Part 27 licensees, a matter that is dealt with by another section of the Commission's rules, Section 27.53(f). Thus Flarion's concerns have no bearing on QUALCOMM's Petition.

(“NAB/MSTV”), Pappas Southern California License, LLC (“Pappas”), and Cox Broadcasting, Inc. (“Cox”). These entities represent broadcast interests who are concerned about potential interference to their over-the-air broadcast stations if the Commission were to grant the QUALCOMM Petition. We shall focus these Reply Comments on concerns raised by these parties and demonstrate that their objections are either unfounded or overblown.

II. DISCUSSION

A. OET-69 Is An Acceptable Engineering Method Under Section 27.60(b)(1)(iii).

1. Legal Arguments Against OET-69 Do Not Prevail.

NAB/MSTV argue that it is “axiomatic” under the Administrative Procedure Act (“APA”) that an agency’s codified rules cannot be amended outside of a notice-and-comment rulemaking.⁷ QUALCOMM agrees. However, it is also “axiomatic” that the Administrative Procedure Act requirement does not apply to

“interpretative rules, general statements of policy, or rules of agency organization, procedure or practice”⁸

QUALCOMM’s Petition clearly seeks an interpretative rule in that it merely asks the Commission to clarify that an engineering study submitted pursuant to the requirements of Section 27.60(b)(1)(iii) may use the OET-69 methodology to calculate interference.⁹ The rule itself simply says that a 700 MHz licensee may file an engineering study, but the rule does not

⁷ NAB/MSTV at 5.

⁸ 5 U.S.C. § 553(b)(3)(A).

⁹ That is, the QUALCOMM Petition seeks an interpretative rule, if it calls for a rule at all. As the U.S. Court of Appeals for the D.C. Circuit recently suggested, the Commission may treat a Petition for Declaratory Ruling, filed pursuant to Section 1.2, as an informal adjudication, pursuant to Section 554(e) of the Administrative Procedure Act, which is an independent reason why the Commission need not engage in a notice and comment proceeding. See *Central Texas Telephone Cooperative v. FCC*, 2005 U.S. App LEXIS 4057, 4067 (March 11, 2005) (*Central Texas*)

specify the methodology for calculating interference in such a study. Nothing in the Administrative Procedure Act, or the case law construing it, requires the Commission to conduct a notice and comment proceeding to clarify that a particular methodology satisfies the rule.¹⁰

Indeed, many 700 MHz licensees are concerned that the requirements of the rule are unclear and that compliance will be difficult without further direction from the FCC. For example, in its Comments, Motorola noted:

Currently 700 MHz licensees are uncertain as to what is required to comply with Section 27.60 of the Commission's rules ... This lack of clarity is delaying licensees' deployment of new and innovative services using this spectrum. Clarifying the Commission's process and intent will facilitate the full utilization of this spectrum throughout the DTV transition while also protecting incumbent broadcasters from harmful interference.¹¹

Other Commenters also mentioned their problems with various interpretations of Section 27.60.

For example, Harbor cautioned that:

Manufacturers have been slow to devote the necessary resources to the development of state of the art 700 MHz products due in large part to uncertainty regarding the interference rules and the overall transition framework.¹²

The record demonstrates that there is substantial uncertainty over the proper interpretation of Section 27.60 and, thus, that there is a valid need for the Commission to

¹⁰ Similarly, as discussed in II.B.1. *infra*, the APA does not require that the Commission conduct a notice and comment rulemaking before deciding whether a licensee can meet the requirement of Section 27.60 to "reduce the potential for interference" by submitting an OET-69 study showing that it will cause interference to 2% or less of the population served by a DTV or TV station. On this issue as well, QUALCOMM is simply asking the Commission to interpret its rule. Moreover, in II.C. *infra*, QUALCOMM shows that the Commission need not conduct a notice and comment rulemaking to decide whether to use streamlined processing under Section 27.60. That is an issue of agency organization, procedure or practice, for which rulemaking is not required under the APA.

¹¹ Motorola Comments at 2-3.

¹² Harbor Wireless Comments at 2.

establish an interpretative rule by relying on QUALCOMM's Petition. The touchstone for distinguishing a permitted "interpretative" rule from a forbidden "legislative" rule is whether it effectively amends a previous legislative rule.¹³ As the DC Circuit recently said in *United States Telecom Association and Century Tel. Inc. v. FCC*,

fidelity to the rulemaking requirements of the APA bars courts from permitting agencies to avoid those requirements by calling a *substantive regulatory change* an interpretative rule.¹⁴

Similarly, the Supreme Court has held that if an agency adopts "a new position *inconsistent with* an existing regulation," it must do so only after notice and comment.¹⁵

Here, a declaration that OET-69 is among the acceptable engineering studies contemplated by Section 27.60(b)(1)(iii) is in no way inconsistent with the existing rule, which does not specify the methodology to be used to calculate interference in such an engineering study. The rule simply provides that such a study is one of four ways that a 700 MHz licensee can meet the TV/DTV protection requirements:

(iii) Submit an *engineering study* justifying the proposed separations based on the parameters of the land mobile station and the parameters, including authorized and/or applied for facilities, of the TV/DTV station(s) it is trying to protect.¹⁶

As the U.S. Court of Appeals for the D.C. Circuit in *Central Texas Telephone Cooperative v. FCC*, 2005 U.S. App. LEXIS 4057 (March 11, 2005) said, an interpretative rule

¹³ See, e.g. *American Mining Congress v. Mine Safety & Health Administration*, 995 F.2d 1106 (D.C. Cir. 1993); *Sprint Corp. v. FCC*, 315 F.3d 369 (D.C. Cir. 2003).

¹⁴ *USTA v. FCC*, 2005 U.S. App. LEXIS 4058, (D.C. Circuit, March 11, 2005) (emphasis added).

¹⁵ *Shalala v. Guernsey Memorial Hospital*, 514 U.S. 87, 100 (1995) (emphasis added).

¹⁶ 47 C.F.R. § 27.60(b)(1)(iii) (emphasis added).

“must be interpreting something”.¹⁷ In this case, QUALCOMM is asking the Commission to interpret the words “engineering study” in the rule to include studies conducted using the OET-69 methodology. NAB/MSTV do not attempt to argue that a study based on OET-69 is not an “engineering study” within the meaning of the Commission’s rule. Rather they maintain that OET-69 involves an “interference standard” not provided for in Section 27.60 and designed strictly for measuring “broadcast-to-broadcast” interference.¹⁸

This argument fails. Section 27.60 establishes no constraints on the kind of “engineering study” required under the rule. Nor does Section 27.60(b)(1)(iii) establish any “interference standard” that would justify the proposed separations.¹⁹ Nor does Section 27.60 prevent the use of a study originally designed for one purpose being used for another. In fact, the rule does not in any way limit the kind of engineering study which can be used. In that circumstance, use of the OET-69 methodology to calculate interference cannot be said to be “inconsistent with” or a “substantive change to” Section 27.60. Rather, a declaration that OET-69 satisfies the engineering study requirement is merely supplying a “crisper and more detailed” understanding of Section 27.60.²⁰ Consequently, the Petition does not require the Commission to adopt a legislative rule and is not prohibited by the Administrative Procedure Act.

Further, NAB/MSTV argue that Section 27.60 does not allow for use of OET-69 in measuring interference, primarily because there is no explicit mention of OET-69 in Section

¹⁷ *Id* at 14.

¹⁸ NAB/MSTV Comments at 7.

¹⁹ *Id.* QUALCOMM assumes that NAB/MSTV are referring to QUALCOMM’s proposal that a *de minimis* interference standard be applied to a showing under Section 27.60 (b) (1) (iii). This is a separate issue from the question of whether OET-69 is appropriate for use with Section 27.60.

²⁰ *USTA v. FCC* at 18, citing *American Mining Cong.* at 1112.

27.60 or in any of the various Orders establishing the rule.²¹ NAB/MSTV point to rules where OET-69 *is* mentioned. However, NAB/MSTV fail to point to the mention of any other type of study in the Orders adopting Section 27.60. It appears that, not wanting to constrain licensees by requiring a certain kind of study, the Commission simply did not specify a particular engineering methodology to be used. Failure to prescribe the use of any particular study should not be seen as a proscription against OET-69.

Indeed, the FCC recently approved both the *Access Spectrum* and *Aloha Partners* requests for waiver under Section 27.60, which were based on engineering studies related to the Stanks Report.²² There is no mention of the Stanks Report and its associated methodologies in the Orders adopting Section 27.60. Yet, through its approval of waiver requests that rely on the Stanks Report, the FCC has made it clear that it will accept this type of engineering study in accordance with Section 27.60. The fact that the Commission did not discuss the OET-69 methodology when adopting Section 27.60 is no reason to deny QUALCOMM's Petition, anymore than failure to mention the Stanks Report would have been reason to deny the *Access Spectrum* and *Aloha Partners* requests.

Commenters also argue that Section 27.60 essentially prohibits a 700 MHz licensee from operating within the Grade B contour because the rule establishes D/U ratios at the boundary of a station's service contour.²³ QUALCOMM agrees that the Commission decisions in *Access Spectrum* and *Aloha Partners* require a waiver of Section 27.60 when a 700 MHz

²¹ NAB/MSTV Comments at 13.

²² *Access Spectrum*, LLC, Request for Waiver of Section 27.60, DA 04-2527, released August 12, 2004, at ¶9 (*Access Spectrum*); *Aloha Partners*, LP, Request for Waiver of Section 27.60, DA 05-460, released February 18, 2005, at ¶4 (*Aloha Partners*).

²³ NAB/MSTV Comments at 14. "Grade B Contour" refers to the protected contour of a TV station and the equivalent protection provided for a DTV station.

licensee proposes to locate its transmitter within the hypothetical Grade B contour of a broadcast station. However, the QUALCOMM Petition was premised on the need for such a waiver in that circumstance.²⁴ There is no prohibition, of course, when the Commission waives the rule as it has done in the case of *Access Spectrum* and *Aloha Partners*.

2. OET-69 Is Not Unsuitable As A Measure of Interference from Wireless Services Like MediaFLO.

Commenters also argue that OET-69 is unsuitable for a variety of other reasons. First, they argue that it is not appropriate for measuring interference from a non-DTV service.²⁵ Second, they point out a number of flaws in the OET-69 process itself, which call into question its applicability for television-to-television interference analysis.²⁶ QUALCOMM will respond to each of the criticisms in turn.

a. Inability to accurately measure non-broadcast interference.

One of the primary complaints of NAB/MSTV is that the OET-69 engineering methodology is specifically limited to measuring “broadcast to broadcast” interference and therefore cannot be applied to Part 27. This argument is flawed. Interference occurs between systems that transmit signals, not between “services” as they are defined for regulatory purposes. Therefore, it is irrelevant from an engineering perspective what service rules or definitions are associated with the systems whose interference impact is being studied. The fact that MediaFLO

²⁴ See QUALCOMM Petition at n. 27, 28, 42 and p. 23. It appears that NAB/MSTV may have misunderstood this point.

²⁵ NAB/MSTV at 16.

²⁶ Yet, quite recently, the parent company of Pappas has argued the advantages of OET-69 in connection with operation of unlicensed (non-DTV) devices in the “white space” of TV Broadcast Bands in ET Docket No. 04-186. Comments of Pappas Telecasting Companies, ET Docket No. 04-186, November 30, 2004 at 8. (“By adopting interference protection standards for unlicensed services that are based on the same predictive contour protections applicable to full-power stations, *rather than the more accurate “real-world” service predicted by the Longley-Rice method*, the Commission will likely open the door to the loss of some existing service provided to the public by permitting unlicensed devices to operate even outside the periphery of the predicted service contours ...) (emphasis added).

is not a “broadcast” service under the Commission’s rules and the Communications Act is simply no reason why the OET-69 methodology should not be used in calculating MediaFLO to television interference. The OET 69 methodology would accurately calculate such interference, and that is why the Commission should permit QUALCOMM to use it in its engineering studies.

As QUALCOMM showed in its petition, the MediaFLO waveform, which is based on OFDM, looks quite similar to the ATSC DTV waveform from an interference perspective. While there are differences between ATSC and FLO, they are both digital “noise-like” technologies that occupy approximately the same 6 MHz bandwidth. And, most importantly, they are both transmit-only systems, which is critical for interference analysis purposes. For these reasons, QUALCOMM believes that the OET-69 engineering methodology is the *most* appropriate methodology available to calculate interference from MediaFLO to TV/DTV stations.²⁷

b. Inability to compute interference under strong signal conditions.

In their Engineering Statement, NAB/MSTV claim that the D/U ratios used by OET-69 are “only applicable to computing interference at the outer edge of the TV station’s service area, where weak signal conditions generally exist.”²⁸ They further state that the FCC’s OET-69 software contains placeholders for different D/U ratios for moderate-to-strong signal situations, but admit that the FCC has chosen not to implement these different D/U ratios. QUALCOMM acknowledges that ATSC has recommended different D/U ratios for

²⁷ It is noteworthy that the broadcaster Commenters who object to QUALCOMM’s use of OET-69 did not propose any alternative.

²⁸ NAB/MSTV Engineering Statement at 4.

strong signal conditions.²⁹ However, it is important to note that despite numerous opportunities to acknowledge the need for these different D/U ratios by implementing these recommendations, the FCC instead has granted countless applications for stations requesting authority to place adjacent channel transmitters well within the protected contour of another station.³⁰ These approved applications include requests by full-power analog, DTV, as well as LPTV stations and, in many cases, the proposed transmitters are not co-located (either literally or virtually) with the adjacent channel station.³¹ These applications have all been accompanied by OET-69 analyses that rely on use of the very D/U ratios that NAB/MSTV state are only applicable to weak signal conditions at the periphery of the victim station's service area.

In its Petition, QUALCOMM does not request a novel application of OET-69 or the use of D/U ratios for moderate-to-strong signal conditions. Rather, QUALCOMM simply requests that the FCC apply the same methods that it has determined to be acceptable in the case of "broadcast to broadcast" interference to Part 27 licensees as well. QUALCOMM further

²⁹ "ATSC Recommended Practice: Receiver Performance Guidelines," Doc A/74, June 18, 2004, Table 4.2, at 13.

³⁰ See, e.g., *Amendment of Parts 73 and 74 of the Commission's Rules to Establish Rules for Digital Low Power Television, Television Translator, and Television Booster Stations and to Amend Rules for Digital Class A Television Stations*, MB Docket No. 03-185, Notice of Proposed Rulemaking, rel. August 29, 2003 at ¶45 (*Low Power NPRM*). ("Our DTV prediction methods and computer model have been used for several years in the processing of applications for DTV and NTSC TV facilities".) See also *Mediacasting, LLC*, Application File No. BPTTL – 20030307 ABS, March 8, 2004; *MS Communications, LLC*, Application File No. BNPTTL – 20000831CD1, April 24, 2003; *Cayo Hueso Networks, LLC*, Application File No. BMP TTL – 20030627 ABN, September 15, 2003. (Examples of LPTV applications for facilities located within the Grade B Contour of an adjacent channel full-power station, but not co-located with the adjacent channel station, relying on OET-69 analyses.) See also *KNTV License Inc.*, DA 04-2523, August 13, 2004; *Amendment of Section 73.622(b)*, *Green Bay, Wisconsin*, DA 04-3236, October 20, 2004; *Amendment of Section 73.622(b)*, *Las Vegas, Nevada*, DA-99-1369, July 13, 1999. (Examples of applications for full power stations located within the Grade B Contour of an adjacent channel full power station, relying on OET-69 analyses).

³¹ See, e.g., *Community Television, Inc.*, Application File No. BMP EDT-20040503 AFV, May 3, 2004; *Christian Television of Palm Beach County, Inc.*, Application File No. BMPCDT-20021028 AAK, October 23, 2002; *Raycom America, Inc.*, Application File No. BMPCDT-20020719 AAD, July 19, 2002. (Examples of full power station applications for facilities located within the Grade B Contour of an adjacent channel full power station, but not co-located (literally or virtually) with the adjacent channel station, relying on OET-69 analyses.)

believes that the use of OET-69 with the existing Part 27 D/U ratios is not only appropriate for moderate-to-strong signal situations, but is ultimately more conservative than the application of the Part 73 or 74 D/U ratios given that the Part 27 D/U ratios are stricter than their Part 73 and 74 equivalents.

c. Failure to consider aggregate interference from multiple stations.

NAB/MSTV's engineering statement argues that the Root-Sum-Square ("RSS") method proposed by QUALCOMM to address the potential for increased interference as a result of the combined MediaFLO signals is misleading because it is only applicable in cases "where the signals of the separate noise or noise-like contributors are totally uncorrelated."³² QUALCOMM fully agrees with the NAB/MSTV assertion that the RSS method is the appropriate method in cases where the signals are uncorrelated. This is precisely the situation that will exist with MediaFLO.

First, as indicated in QUALCOMM's petition, the FLO air interface is "noise-like," i.e. uniform in long term power density and rapidly decorrelating by design. The mere fact that it is noise-like is evidence of a lack of correlation. Second, due to the fact that there are separate transmitters producing the multiple undesired signals, the path diversity from these individual sites will result in uncorrelated signals at the TV receive antenna.

Third, even if QUALCOMM were to force time and phase correlation of its MediaFLO signals, which it will not, the region over which correlation can be theoretically achieved is very small. Only the locus of points that are equidistant from all transmitters can theoretically achieve this. In the case of two transmitters, this locus is a line. In the case of three or more transmitters, it is a single point. The signal at the point of peak correlation would

³² NAB/MSTV Engineering Statement, p. 8.

hypothetically be 3 dB higher, as NAB/MSTV suggest. However, the affected area is only one eighth of a wavelength in width or diameter, since beyond this region the signals are decorrelated due to the differences in distance traveled by the respective signals. At 716-722 MHz, which is the frequency range where MediaFLO will operate, one eighth of a wavelength is only two inches. Therefore, the potential region of correlation is so small as to be ridiculous to consider.

For these reasons, the NAB/MSTV concern regarding RSS as an inappropriate methodology for correlated signals is unwarranted. QUALCOMM's MediaFLO signals are noise-like, rapidly decorrelating in time and uncorrelated in phase. Therefore, RSS is the most appropriate methodology for assessing the combined impact of the MediaFLO transmitters on a television station.

d. Vertical elevation patterns that differ from those QUALCOMM will use.

The NAB/MSTV Engineering Statement questions whether in its three sample analyses QUALCOMM has used the default vertical antenna patterns for both the broadcast and MediaFLO antennas. The analyses included in the engineering statement attached to QUALCOMM's Petition used the default vertical antenna patterns included in OET-69. QUALCOMM used these default patterns because the Commission's OET-69 analyses are conducted using these defaults, despite known differences among actual antenna patterns. However, in the interest of assuaging any concerns, QUALCOMM's broadcast engineering consultants have re-run the analyses using the actual MediaFLO antenna patterns.³³ The results are identical. There is no difference between the analysis using the default patterns and that

³³ See Attachment A.

using the actual MediaFLO pattern. NAB/MSTV's fears that the actual vertical antenna pattern would "significantly underestimate the amount of close-in interference" were unfounded.

3. OET-69 Is Not Unsuitable for Measuring Interference to TV Stations.

In addition to claiming that OET-69 is unsuitable for measuring interference from Part 27 licensees, opposing commenters also argue that OET-69 has numerous flaws that make it inappropriate for measuring interference to television stations at all. Among the flaws mentioned are: a) inattention to service outside the protected or noise-limited contour, b) lack of cumulative undesired signal contribution assessment, c) assumed receive antenna rejection factor, d) use of a propagation model that does not transfer well to dense urban areas, and e) inability to assess interference at cable heads.

a. Inattention to television service outside the protected contour.

Both NAB/MSTV and Cox complain that OET-69 is an inappropriate engineering methodology because it does not recognize service beyond the noise-limited contour of a television station. Their complaint is directed at the use of OET-69 by a Part 27 licensee. However, the limitation that they refer to is inherent to OET-69 itself and is not related to whether OET-69 is used by a Part 27 licensee, a TV or DTV station, or an entity with some other regulatory status. QUALCOMM agrees with NAB/MSTV and Cox that OET-69 does not analyze cells outside of the victim station's protected contour. It is specifically designed not to assess interference potential outside of a station's service area, which is defined as the Grade B contour. The FCC's rules regarding interference to television stations, whether television to television or Part 27 to television, limit the area of protection to locations within the Grade B contour, thereby eliminating the need to analyze cells outside the contour. Therefore, the flaw that NAB/MSTV and Cox refer to is in fact not a flaw, but is an intentional feature of OET-69

designed to meet the FCC's rules regarding protection areas. The fact that OET-69 does not measure interference outside of the Grade B contour of a TV or DTV station is irrelevant to whether the FCC should allow QUALCOMM to use OET-69 since QUALCOMM seeks only to use it to calculate interference within the Grade B contour. This is the only calculation relevant under Section 27.60.

b. Lack of cumulative undesired signal contribution assessment.

NAB/MSTV argue that an inherent flaw of OET-69 is that it does not include the cumulative effect of multiple undesired signals. QUALCOMM does not disagree with their assertion that the cumulative impact of other undesired signals is not taken into consideration by the OET-69 process – whether it is the case of television to television interference or Part 27 to television interference. QUALCOMM is not suggesting amending the existing and well-tested process used by television stations to protect against such interference, other than to make changes necessary to comply with the differences in the Part 27 rules, such as the more stringent D/U ratios and the ability of Part 27 licensees to deploy more than one transmitter in a market. Otherwise, QUALCOMM proposes to use the same OET-69 process and methods that are currently used by television stations.

c. Assumed receive antenna rejection factor.

Both NAB/MSTV and Cox also complain that OET-69 is inappropriate for assessing interference from transmitters located within a station's Grade B contour because the methodology assumes receive antenna rejection of the undesired signal. This receive antenna factor is built into the existing OET-69 process and is assumed in situations where applications for new television transmitters are located inside and/or outside of the victim station's Grade B contour. QUALCOMM again is not proposing modification to the existing methodology and its

application beyond the use of the stricter Part 27 D/U ratios and the cumulative effect of QUALCOMM's multiple MediaFLO transmitters.

c. Use of a propagation model that does not transfer well to dense urban areas.

Cox also makes a number of complaints in its engineering statement regarding the propagation model used by OET-69. OET-69 relies on the use of the Longley-Rice propagation model, which the FCC has praised on numerous recent occasions as being a much improved predictor of real-life situations than previous approaches, such as the overlapping contour approach.³⁴ QUALCOMM again does not seek to change the OET-69 process as it has been developed and applied in countless television applications. It is recognized that there are advantages as well as limitations to the Longley-Rice propagation model, as there are with any prediction model. However, Longley-Rice is the preferred methodology of the FCC for predicting interference to television stations and is the methodology used by OET-69. Therefore, QUALCOMM is not proposing to change the propagation model to something other than Longley-Rice.

e. Inability to assess interference at cable heads.

Finally, Pappas objects to use of OET-69 because it does not consider the impact of interference to cable television subscribers.³⁵ Pappas argues that if the MediaFLO transmitter were to be located near a cable headend, its high signal strengths could degrade the headend's ability to retransmit the signal. QUALCOMM agrees that this is a concern for stations that are relying on over-the-air delivery of their broadcast signal to cable television systems.

³⁴ *Low Power NPRM* at ¶ 43-44. See also n. 26 *supra*

³⁵ Pappas at 12.

Were the exact location of a cable headend receive antenna known, the OET-69 methodology would enable QUALCOMM and other Part 27 licensees to identify whether that location would be impacted by interference. The OET-69 software has not been programmed to identify and isolate interference potential at a cable headend location, instead treating all potentially affected locations equally. However, QUALCOMM recognizes that continued carriage on cable systems is critical for all broadcast stations and is willing to work with the impacted stations on an individual basis to identify and resolve problems that arise from QUALCOMM's MediaFLO operations to ensure that the cable headends are able to retransmit the TV/DTV signals.

In sum, QUALCOMM does not disagree that there are some imperfections in OET-69. However, it is widely used by the Commission despite these imperfections because it is the best available interference prediction methodology. Because the opposing Commenters' legal arguments do not bar immediate use of OET-69 in engineering studies for Section 27.60(b)(1)(iii) purposes and because the opposing Commenters are wrong or overreaching in their criticisms of OET-69, QUALCOMM asks the Commission to declare that OET-69 is an acceptable engineering methodology under Section 27.60.

B. A De Minimis Standard of Interference Is Appropriate

1. Section 27.60 Does Not Prohibit Any New Interference

The opposing Commenters are united in their belief that Section 27.60 prevents *any* interference with broadcast television service. They rely on a variety of statements offering "full protection" as a "core value." They do not, however, recognize a more flexible approach taken by the Commission more recently, an approach that is inherent in the formulation and the language of Section 27.60.

First, it should be noted that if the Commission had sought to guarantee broadcasters “full protection” during the DTV transition, it could have simply prevented any 700 MHz transmissions. It did not. Rather, perhaps recognizing the temporary nature of broadcasters’ use of the 700 MHz spectrum, the Commission attempted to balance protection of the broadcasters with the desire to inaugurate new wireless services on the 700 MHz spectrum. The Commission concluded that it could

adopt interference protection criteria that will permit the provision of both broadcast and fixed and mobile services without harmful interference among users.³⁶

In protecting against “harmful” interference, the Commission established signal strength limits that it considered a reasonable balance between the needs of broadcast licensees and 700 MHz service providers.

Further, the language of Section 27.60 itself makes it clear that the Commission understood that a “no new interference” standard was not appropriate. The preamble to the rule states its purpose:

to *reduce the potential* for interference to public reception of the signals of existing TV and DTV broadcast stations transmitting on TV Channels 51 through 68.³⁷

Use of language such as “harmful interference” and “reduce the potential” reflects the Commission’s recognition that some interference from 700 MHz licensees to TV/DTV stations is likely. The objective of the rule, then, is to achieve the balance between minimal interference and the opportunity to deploy new services. In fact, Section 27.60(b)(1)(iii) is open ended in describing how a 700 MHz licensee may show that its proposed operations will achieve

³⁶ *Reallocation and Service Rules for the 698-746 MHz Spectrum Band (Television Channels 52-59)*, GN Docket No. 01-74, Report and Order, 17 FCC Rcd 1022, 1032 (2002) (*Lower 700 MHz Order*).

³⁷ 47 C.F.R. §27.60.

an acceptable balance in that it simply requires the licensee to submit an engineering study “justifying the proposed separations” without indicating anything about the type of justification that will be acceptable. QUALCOMM believes that it should be made clear that minimal interference levels are established at less than 2% of the viewing population affected and are therefore acceptable. This is the interpretative rule that QUALCOMM is seeking.

Second, Commenters ignore the two recent cases in which the Commission has interpreted Section 27.60 in a manner that establishes that the rule does not create an absolute “no new interference” standard. In both the *Access Spectrum* and the *Aloha Partners* cases, the Commission saw the rule as permitting 700 MHz operations where it can be demonstrated that interference to TV/DTV stations will be prevented. This emphasis on allowing 700 MHz operations reflects the Commission’s recognition that it is in the public interest to encourage the deployment of new 700 MHz services.

Broadcasters opposed both the *Access Spectrum* and the *Aloha Partners* requests for waiver, fearful – as they are in this case – that allowing any 700 MHz operation will encroach on their use of the spectrum, even though their use is only temporary and their resources could better be occupied effecting the transition to DTV. They should have more faith in the ability of the Commission to fashion a reasonable balance that will take into account the protection that should be given broadcasters, as well as the public interest in the deployment of new services.

Third, and most importantly, we note that broadcasters’ claims that Section 27.60 prevents *any* new interference are undercut by the rule itself. Section 27.60(b) (1) (iv) permits operation of 700 MHz transmitters with the written concurrence of the applicable TV/DTV station. In other words, there is no limit on the amount of interference permitted if the affected broadcaster agrees. Further, if the rule were “no new interference”, there would be no need for

the submission of an engineering study “justifying” the proposed separations. Either the geographic separation in Section 27.60(b)(1)(i) would be met, or separation would be in accordance with the required D/U ratios. Only if the Commission were prepared to accept some departure from these standards would there be a need for either an engineering study, under Section 27.60(b)(1)(iii) or written concurrence under Section 27.60(b)(1)(iv). The broadcasters have utterly failed to present a reasonable interpretation of Section 27.60 in its entirety.

In sum, we disagree with the Commenters who claim that Section 27.60 establishes a “no new interference” standard at the expense of deployment of new 700 MHz services. Rather, we believe that the rule requires operations that “reduce the potential” for harmful interference, just as the rule says, and that submission of an engineering study that shows that the interference will be 2% or less meets the requirement in the rule of a study “justifying the proposed separations”. This *interpretation* of the rule, which does not require a “notice and comment” procedure under the APA, would allow the Commission discretion to adopt a 2% *de minimis* standard if it found doing so to be in the public interest.³⁸

³⁸ As an additional matter, NAB/MSTV argue that the FCC recently decided to apply a 0.1% standard for protection of a station’s “locked-in” DTV channel during the channel election process and that this indicates an unwillingness on the part of the Commission to continue to apply the 2% *de minimis* standard, even though it remains in the Rules. This argument mixes apples and oranges and is misleading. As the Commission has explained, the new strict 0.1% threshold is only applicable to requests made as part of the DTV channel election process, which is completely unrelated to the temporary *de minimis* interference that might be caused in the 700 MHz band, which will be vacated in that process. Moreover, during the DTV channel election process, the FCC permits an additional 0.1% interference above and beyond the 2% *de minimis* amount that DTV stations may already cause other stations as part of the initial allotment process. In fact, the 2% new interference threshold continues to apply to allotment requests not associated with the channel election process. Therefore, there is no justification for the NAB/MSTV assertions that the 0.1% channel election threshold has any relation to the proposal QUALCOMM has made regarding application of OET-69 and the *de minimis* standard to the temporary situation where 700 MHz licensees will be sharing spectrum with out-of-core stations.

2. De Minimis Standard Is In the Public Interest

QUALCOMM believes that the *de minimis* standard could be useful in hastening the deployment of the new 700 MHz services, thereby serving the public interest. First, however, it is necessary to correct misimpressions given by the Commenters as to the impact of the *de minimis* standard. While we do not deny that some broadcast operations would be temporarily affected, the Commenters have grossly exaggerated the extent of that impact.

In their comments, NAB/MSTV calculate that “a minimum” of 4.7 million viewers would be impacted by application of the *de minimis* threshold to QUALCOMM’s MediaFLO operations (taking 235 million people, the number of people they say are served by Channel 54-56 stations, and multiplying it by 2%). This calculation grossly overstates the *maximum* number of persons who might be affected. First, not every market in the country has a station on Channel 54, 55 or 56. Second, NAB/MSTV double count people that are being served by more than one station (TV or DTV) operating on Channels 54-56. Our estimate of the total number of people being served by all authorized full power stations on Channels 54-56, based on Grade B and equivalent service areas of all authorized full service TV and DTV stations on those channels and 2004 population group data, is 184,886,210. If we apply the FCC’s 85% estimate of those who rely on cable and satellite delivery, rather than over-the-air, that number is reduced to 27,732,000.³⁹ The total maximum number of viewers who might be affected is thus 554,640. That is the maximum number of viewers nationwide who could be impacted by the application of the 2% *de minimis* threshold to QUALCOMM.⁴⁰

³⁹ FCC Media Bureau Staff Report Concerning Over-the-Air Broadcast Television Viewers, MB Docket No. 04-210, February 28, 2005, p. 3.

⁴⁰ We note that in the previously submitted engineering studies for New Orleans, Phoenix and Oklahoma City, QUALCOMM has demonstrated impact well below the 2% level.

Understanding that it is QUALCOMM's intent that broadcast disruption would truly be minimal, as well as temporary, we believe that our proposal will help to hasten the deployment of 700 MHz services and the end of the DTV transition. In this respect, it is entirely consistent with, and supportive of, the recently released Report by the Wireless Broadband Access Task Force. That *Task Force Report* was issued by FCC experts to consider ways in which the Commission policies could "facilitate the more rapid deployment of wireless broadband services for the benefit of all Americans."⁴¹ The Task Force reviewed the many public benefits associated with advanced wireless services, including mobile access to music and video programming, and made specific recommendations, including some that relate directly to 700 MHz Spectrum and to the QUALCOMM Petition.

The *Task Force Report* recommends that the DTV transition be expedited.⁴² This will free more spectrum for broadband services. Further, the Commission should work with Congress to consider mandating a hard deadline for the completion of the DTV transition.⁴³

In the meantime, the *Task Force Report* suggests using "additional mechanisms for allowing 700 MHz channels to be used for wireless broadband services before the completion of the DTV transition."⁴⁴ Specifically,

the Commission could consider ways to make it easier for wireless licensees to make use of the spectrum for wireless broadband services during the transition pursuant to more flexible policies that permit such licensees to use the

⁴¹ *Task Force Report* at 1.

⁴² *Id.* at 62.

⁴³ *Id.*

⁴⁴ *Id.*

spectrum so long as such action does not result in *undue displacement of television viewers*.⁴⁵

The *Task Force Report* goes on to suggest “clarifying or revising...interference criteria” and “devising a streamlined process by which licensees can establish that their operations comply with the applicable interference criteria or only result in a *de minimis* impact on viewers.”⁴⁶

In other words, the Task Force recommends almost exactly what QUALCOMM proposes. We believe the Commission should find the *de minimis* proposal to be consistent with Section 27.60 and in the public interest.

C. Streamlined Processing Will Advance The Public Interest.

NAB/MSTV argue that Section 27.60 does not permit the Commission to establish streamlined procedures.⁴⁷ Again, NAB/MSTV premise this argument on the notion that streamlined procedures would amend Section 27.60 in violation of the Administrative Procedure Act. And again NAB/MSTV are wrong. The Commission may adopt “rules of agency organization, procedure or practice” without the necessity of a notice and comment procedure pursuant to the exception found in Section 553(b)(3)(A) of the Administrative Procedure Act.⁴⁸

The procedures QUALCOMM suggests would not affect the substantive rights of any party. The 700 MHz licensee would still be required to seek a waiver if it intended to locate transmitters within the Grade B contour.⁴⁹ The burden would continue to be on the 700 MHz

⁴⁵ *Id* at 62-63 (emphasis added).

⁴⁶ *Id* at 63.

⁴⁷ NAB/MSTV at 18.

⁴⁸ See n. 9. *supra*.

⁴⁹ NAB/MSTV and Pappas appear to misunderstand the QUALCOMM proposal in this respect. We note that even if no waiver were sought, Commission approval would be required.

licensee to demonstrate compliance with the requirements of Section 27.60 -- that is, to “justify” the proposed separations using an OET-69 engineering study. If it can meet this test, the licensee would file a waiver request which would be the subject of the rebuttable presumption and streamlined processing. The affected broadcaster could be notified at the time of the filing, by service, rather than at the time of the Public Notice.⁵⁰

Pappas argues that this proposal is inconsistent with “the law of this Circuit” which requires that the preservation of existing broadcast services take precedence.⁵¹ To support this argument Pappas cites a 1964 transmitter relocation case, which is itself quoting a 1954 case involving a construction permit modification.⁵² In that case the Court said, speaking of a possible diminution of service to a TV station service area:

That such a curtailment of service is not in the public interest is axiomatic. Whether or not it may be offset by concomitant factors is something the Commission should consider.⁵³

QUALCOMM believes that the Commission will have ample opportunity to consider those offsetting factors in the context of a streamlined process. A broadcaster facing a curtailment of service, however minimal and temporary, can object to the grant of a 700 MHz licensee’s request for waiver, *at which point streamlined procedures would not apply*.⁵⁴ Only when a request is unopposed (and when the showing under OET-69 of a *de minimis* impact is

⁵⁰ As a practical matter, the affected broadcaster is likely to have had actual notice of the licensee’s intentions before the filing of its application because the licensee will have approached the broadcaster to discuss its plans.

⁵¹ Pappas Comments at 15.

⁵² *Triangle Publications, Inc.*, 3RR 2d 37 (1964), citing *Hall v. FCC* 237 F.2d 567 (D.C. Cir 1954)

⁵³ *Hall* at 572.

⁵⁴ QUALCOMM Petition at 23.

present) would a request for waiver receive streamlined treatment. A “curtailment of service” argument would not prevail where, as here, the Commission would have ample opportunity to consider specific factors off-setting a loss of service.⁵⁵

Pappas proposes an alternative procedure which involves formal notification of an affected broadcaster at least 60 days before submitting a waiver request or Section 27.60 showing to the FCC. While in practice it is likely that the 700 MHz licensee and the broadcaster will have discussed the matter, QUALCOMM believes a requirement of “good faith” negotiations is time-consuming, dilatory and unnecessary. The Commission should disregard the Pappas proposal.

In sum, a streamlined processing approach will reduce the administrative burden and hasten the deployment of new 700 MHz services, without depriving the Commission of opportunity to fully evaluate contested situations.

D. Grant Of The Petition Will Not Create A “Windfall” For 700 MHz Licensees.

NAB/MSTV argue that 700 MHz licensees had an “abundance of notice” that spectrum obtained would be accompanied by the requirement to protect TV stations during the transition.⁵⁶ If licensees were permitted to operate as if the transition were already complete, they would obtain a “windfall.”⁵⁷

⁵⁵ Where there are no objections and streamlined processing applies, the Commission will still have had an opportunity to consider more generic off-setting factors, such as the deployment of new services or the temporary loss of service to a very small portion of the viewing public.

⁵⁶ NAB/MSTV Comments at 21.

⁵⁷ *Id* at 22.

Perhaps NAB/MSTV misunderstand the QUALCOMM request for declaratory ruling. The proposal to use OET-69, to establish a *de minimis* standard, and to create streamlined processing bears no resemblance to “operation as if the transition were already complete.” When that occurs, 700 MHz licensees will be free to use the spectrum to provide service without concern at all for protecting broadcasters, since they will no longer occupy adjacent and co-channels. Until that day, 700 MHz licensees will spend considerable time and effort in complying with Section 27.60. They will be constrained from offering their new wireless services, services eagerly awaited by the public, by the need to coordinate their operations around those of the broadcasters. They will be required to invest millions of dollars in uncertain markets without knowing when they can begin service. This is no “windfall.” This is no “deal” between the FCC and 700 MHz licensees.⁵⁸

Further, it is highly ironic for broadcasters to complain of a “windfall.” Broadcasters have had full, free use of the same spectrum for which auction participants have paid millions of dollars. During the transition, broadcasters have had use of *two* 6 MHz channels *for which they paid nothing*. It is simply ridiculous for broadcasters to accuse 700 MHz licensees of benefiting from a “windfall.”

E. Protection of Over The Air TV Should Not Be At The Expense Of New Services, But Through Promotion Of DTV.

QUALCOMM agrees that free, over-the-air television should be protected from interference. Indeed, the request for declaratory ruling strives to offer protection from all but *de minimis* interference. However, the only protection that can be absolutely assured will occur as a

⁵⁸ Cox Comments at 3.

result of the transition to DTV. We commend the Commission on its efforts to speed the transition and establish a firm date. We applaud those broadcasters who sincerely welcome the opportunity to provide digital television and who have met the Commission's transition deadlines. It is through the promotion of DTV, not the hobbling of new services, that the public interest will be served.

The broadcasters do make the anachronistic argument that because MediaFLO is a subscription service, it has an inferior regulatory status as compared to "free" over the air television. This is an argument that has its roots in the historic regulatory battles between TV and cable and between TV and satellite interests. MediaFLO is far different from cable and satellite subscription services. MediaFLO will be launched on spectrum that has been auctioned. It will be provided in concert with cellular and PCS services to which over 170 million Americans subscribe and which are a major driver of jobs and economic growth in this country. In interpreting the phrase "reduce the potential for interference" to TV and DTV stations, the Commission cannot ignore the substantial benefits to the American public from a highly innovative service such as MediaFLO, albeit offered on a subscription basis, when these benefits are weighed against temporary interference to a minimal number of households.

III. CONCLUSION

For these reasons, QUALCOMM respectfully requests that the Commission grant its Petition for Declaratory Ruling.

Respectfully submitted,

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Dated: March 25, 2005

ATTACHMENT A

ENGINEERING STATEMENT
PREPARED FOR QUALCOMM INCORPORATED
IN SUPPORT OF REPLY COMMENTS
WT DOCKET NO. 05-7

This engineering statement has been prepared on behalf of QUALCOMM Incorporated in support of its reply comments in WT DOCKET NO. 05-7. It addresses a concern raised by the Association of Maximum Service Television / National Association of Broadcasters (MSTV/NAB) in their Joint Comments on QUALCOMM's Petition for Declaratory Ruling. Specifically, MSTV/NAB express concern with QUALCOMM's use of the OET-69 DTV default vertical antenna pattern in predicting interference from QUALCOMM's MediaFLO™ transmitting stations in the three example market analyses provided with QUALCOMM's Petition for Declaratory Ruling. In the MSTV/NAB engineering statement, they write "Qualcomm has not provided sufficient detail to make a determination, but it is probable that the OET-69 assumed vertical patterns would significantly underestimate the amount of close-in interference compared to the vertical pattern(s) of the antennas that Qualcomm would employ."¹

The OET-69, default DTV vertical antenna pattern was used in the original analyses to match the Commission's own software implementation of the OET-69 methodology, which does not permit input of alternate vertical radiation patterns. However, to test the impact of an actual vertical radiation pattern on predicted interference, PCCI re-ran the analyses for the Phoenix and New Orleans example markets (where QUALCOMM's MediaFLO™ transmitters are to be located within adjacent-channel broadcast stations' Grade B or equivalent Grade B contours). The vertical antenna pattern used was for a Dielectric model TLP-12A antenna system with 1 degree of electrical beam tilt – an antenna of the type likely to be used by QUALCOMM for its MediaFLO™ transmitting stations.

¹ See *Joint Comments and Informal Objection of the Association for Maximum Service Television, Inc. and the National Association of Broadcasters to the Petition for Declaratory Ruling of Qualcomm Incorporated, Engineering Statement* of Cohen, Dippell and Everist, P.C., page 9.

Table 1 contains the vertical plane relative field values for the TLP-12A antenna, derived from Dielectric's published information.

Table 1 – TLP-12A Vertical Plane Relative Field Values			
Depression Angle (deg)	Relative Field	Depression Angle (deg)	Relative Field
0.0	0.919	4.0	0.447
0.5	0.980	5.0	0.192
1.0	1.000	6.0	0.090
1.5	0.980	7.0	0.150
2.0	0.923	8.0	0.143
2.5	0.833	9.0	0.084
3.0	0.718	10.0	0.079
3.5	0.587	11.0	0.132

Using the same inputs as in the original studies, but with the values from the TLP-12A vertical pattern instead of the default vertical pattern values, PCCI re-ran the interference analyses.

Table 2 is a summary of the calculated interference caused to the licensed and authorized facilities of KNXV-DT (Ch.56, Phoenix, AZ).

Table 2 – Interference Comparison, Phoenix Market		
Undesired Station: MediaFLO™ PHOEGS (50 kW-ND, 840 m AMSL, 33-19-57, 112-03-56)		
Desired Station: KNXV-DT (LIC, 73 kW-ND, 866 m AMSL, 33-20-00, 112-03-46)		
Description	Using Default Vertical Pattern	Using TLP-12A Vertical Pattern
Population within noise limited contour	3,219,993	3,219,993
Not affected by terrain losses	3,208,942	3,208,942
Lost to additional interference by Part 27	14,177 (0.44%)	13,462 (0.42%)
Resulting noise limited DTV service	3,194,765	3,195,480
Desired Station: KNXV-DT (CPMOD, 500 kW-ND, 865.6 m AMSL, 33-20-00, 112-03-46)		
Description	Using Default Vertical Pattern	Using TLP-12A Vertical Pattern
Population within noise limited contour	3,234,611	3,234,611
Not affected by terrain losses	3,227,535	3,227,535
Lost to additional interference by Part 27	2,895 (0.09%)	2,882 (0.09%)
Resulting noise limited DTV service	3,224,640	3,224,653

Use of the TLP-12A vertical pattern instead of the default vertical pattern has minimal impact on the calculated interference to KNXV-DT.

Table 3 is a summary of the calculated interference caused to analog television station WUPL (Ch.54, Slidell, LA).

Table 3 – Interference Comparison, New Orleans Market		
Undesired Station: MediaFLO™ NEWO1A (50 kW-ND, 291 m AMSL, 29-58-42, 89-56-26) ²		
Desired Station: WUPL (LIC, 4370 kW-DA, 219 m AMSL, 30-17-08, 089-54-18)		
Description	Using Default Vertical Pattern	Using TLP-12A Vertical Pattern
Population within noise limited contour	1,424,059	1,424,059
Not affected by terrain losses	1,424,059	1,424,059
Lost to additional interference by Part 27	5,422 (0.38%)	5,348 (0.38%)
Resulting noise limited DTV service	1,418,637	1,418,711

Use of the TLP-12A vertical pattern instead of the default vertical pattern has almost no impact on the calculated interference to WUPL(TV).

In conclusion, the use of the TLP-12A antenna vertical pattern instead of the default vertical pattern has virtually no impact on the calculated interference to the adjacent-channel stations in the example markets where QUALCOMM's MediaFLO™ transmitters are proposed within the broadcast stations' Grade B or equivalent Grade B contours.

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² It is noted that there was a minor input error in the longitude for MediaFLO™ transmitter NEWO1A in the original exhibit. That error has been corrected here, and the changes in calculated interference shown in this table are a result of that longitude error correction.